Trends in Consumption of Soft Drinks among Students at the Sunyani Technical University

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Abstract

This study sought to determine the trends in consumption of soft drinks among students at the Sunyani Technical University. The design that was used for the study was the cross-sectional survey. Using the simple random sampling procedure, 191 students of Hospitality and Tourism Department were selected for the study. Data gathered from the use of the questionnaire was analysed using the descriptive statistics namely frequencies, percentages and means. It was found out that, juices, tea, carbonated drinks, cocktail, sweetened juice, milkshake and smoothies were the types of soft drinks that students sometimes consume. Also, students were unaware of most of the dangers that soft or non-alcoholic drinks could pose on their health.

Keywords: Soft Drinks, Calories, Awareness

Introduction

The urbanisation and economic development across the globe including Ghana have brought about a dietary transition from a traditional to a westernized diet, where the quality and quantity of food have changed. This has been accompanied by an increase in consumption of heavily processed and highly caloric foods such as breakfast cereals, candy, bakery products, and sweetened beverages. Out of these products, soft drinks have come to light as having a drastic rise in consumption especially among students (World Health Organization, 2004). Over the past 20 years, the portions of soft drinks have increased. According to the '2008 Global Soft Drinks' report, the net annual consumption of soft drinks over nearly 200 nations is said to be 552 billion litres, which amounts to 82.5 litres per person annually. During 2012, soft drink consumption increased to 95 litres per person annually (Zenith International, 2008). Developing countries including Ghana are actually the largest growth markets for soft drink producers. The average value of Ghana's consumption per year is 116 litres per person. This is quite high compared to the global average of 82.5 litres (Wojcicki & Heyman, 2010; Onyemelukwe, Bakari & Ogbadu, 2006).

As the children grow older, there is an increase and variation in the consumption of beverages. Students and teenagers tend to drink more carbonated beverages and sweetened fruit juices (Grimm et al, 2004). The alarming trend of a rise in soft drink consumption in consumers especially students and adolescents have come under serious notice with possible links to the degenerative diseases (Sales-Peres, Magalhães, Machado & Buzalaf, 2007; Forshee, Anderson & Storey, 2008; Mercola, 2009). Although soft drinks are not the sole reason for the degenerative diseases, they definitely contribute to the onset of the diseases.

The most common health effects associated with increased soft drink consumption are obesity, diabetes, tooth decay, osteoporosis and bone fractures, nutritional deficiencies, heart diseases, addictions, eating disorders, neurotransmitter dysfunctions and neurological disorders (Duyff, 2006; Mercola, 2009). Despite nutritional information being available on each kind of soft drink, both the young and the old continue to consume many litres of soft drink, irrespective of the fact that soft drinks have no nutritional value, except for its high calorie content. Although globally many studies have been conducted with regard to soft drink consumption, research on this behalf in Ghana is seriously lacking. A thorough investigation of the problem (increased soft drink consumption) is essential to unravel the deeper complexities of the issue. Only then, can any interventions be expected to be successful. It is on this background that the researcher decided to undertake this study in order to determine the trends in consumption of drinks among students at the Sunyani Technical University. The research attempts to find solutions to following research questions: "What type of drink is the most consumed among students?" as well as "What is the level of awareness of health hazards associated with drinks?" The study involved students in the Sunyani Technical University in carrying out the study. Rates of soft drink consumption are slowly increasing to become a silent health hazard. Injudicious use of these soft drinks is putting the children's lives at risk with indirect adverse effects. The researcher hopes that the results obtained would help in better understanding of the problem especially the implications of soft drinks and would provide awareness to the students, parents and the country at large. Again, it will help in better planning and implementing strategic interventions to tackle the menace. Again, it is expected that, the study would add up to the information already gathered on the subject by previous studies. The subsequent paragraphs consider the Literature Review, Methodology, Results and Discussions, Conclusions and Recommendations.

Literature Review

Definition of Soft Drinks

A soft drink is a non-alcoholic beverage that typically contains water, a sweetener, acid and a flavouring agent (Ashurst, 2005). Other ingredients may include fruit or fruit juice, carbon dioxide, preservative and colorants. Although small amounts of alcohol may be detected in a soft drink, this alcohol content should not exceed 0.5% of the total volume otherwise the drink will be considered alcoholic. The name "soft" is due to the low amounts of alcohol unlike hard drinks which refer to alcoholic beverages. Soft drinks may be caffeinated or non caffeinated; may be served chilled or at room temperature and are rarely heated. These beverages can be categorized as water drinks; carbonates; dilutables, still and juice drinks and functional drinks. Not all beverages are soft drinks. Examples of beverages that are not considered to be soft drinks are: pure juices, hot chocolate, brewed tea and coffee, milk, and milkshakes (Ashurst, 2005).

Trends in Consumption of Soft Drinks

Soft drinks have become extremely popular across the globe. There are approximately 200 countries consuming soft drinks. On an estimate, 82.5 litres of soft drinks are consumed per person per year. According to the '2008 Global Soft Drinks' report, America alone represents 25% of the total beverage market energy intake consumption of more than 50 billion litres of soft drinks per year (Zenith International, 2008). Developing countries like those in Asia, Latin America and Africa represent the largest growth markets for soft drink producers. Consumers in developing countries are being targeted by the soft drink industry with aggressive marketing often viewed by children (Moreno et al, 2005; Zenith International, 2008).

Prevalence of Soft Drink Consumption in Developing Countries

The national dietary survey in Mexico in 2006 showed a prevalence of 76.1% of soft drink consumption among children (Barquera et al, 2010). Norwegian adolescents have actually shown a decrease in soft drink consumption between 2001 and 2008; probably as a result of educational interventions in place. However, there has been an increased consumption of diet drinks. Males still tend to drink more and frequently than the females (Stea, Øverby,Klepp & Bere, 2012). A study was conducted in 2005 among 2870 Norwegian students of grade 9 and 10. The results showed 63% of the students to consume regular soft drinks while 27% consumed the diet versions at least two times a week. Among these, 32% consumed soft drinks at least once per week at school (Bere, Glomnes, Velde & Klepp, 2007). Sayegh, Dini, Holt & Bedi (2002) found that snacking was quite high among kindergarten children in Amman, Jordan. Among the snacks, soft drinks were popular since more than 50% of the children consumed carbonated drinks regularly. Among the children who consumed carbonated drinks regularly, 60.7% were boys. Sweetened fruit juices were the next popularly consumed drink.

Ratnayake & Ekanayake (2012) conducted a cross-sectional study among school going 17 year olds in Sri Lanka. The results showed that 82% of the adolescents consumed sweetened soft drinks at least once a week. Among these adolescents, 77% consumed carbonated drinks and 48% consumed sweetened fruit drinks at least once weekly.

In 2010, a study was carried out among 400 adolescents aged 8-17 years in Dar-EsSalaam, Tanzania. The frequency and amount of soft drink consumption was assessed. The prevalence of consumption of soft drinks was 61.5%; out of which the prevalence of sweetened juice consumption was 68.3% and prevalence of carbonated beverages was 61.3%. Compared to carbonated beverages which was consumed only once a week, fruit juices was consumed daily by most students. The consumption of soft drinks was also influenced by the type of school. Carbonated beverage consumption was more prevalent among government school students while students from private schools drank more fruit juices (Dhirani, 2010).

In Nigeria, a study has shown nearly 16% of children in Ibadan aged 6-18 months were given soft drinks at least once per day as a weaning drink (Bankole, Aderinokum, Odenloye & Adeyemi, 2006). In an urban area of Uganda, 24-37% of school children drank soft drink daily (Kiwanuka, Astrom & Trovik, 2006).

Theron et al (2007) reported that carbonate drinks were the most commonly consumed item among South African urban children. Consumption was also high in remote areas of South Africa as shown by MacKeown and Faber (2005) where children aged 4 and 24 months consumed soft drinks 2-3 times a week. The consumption of carbonated beverages was greater in the urban areas (33%) while in rural areas it was below 3% (Steyn et al, 2003).

Effects of Increased Soft Drink Consumption

   a) Dental diseases

Dental caries is a destructive process causing initial decalcification of the tooth enamel, leading to continued destruction of the dentine, finally causing cavitations of the tooth (Medilexicon Medical Dictionary, 2012). In addition to the frequency and total sugar consumption, the pathogenesis of the disease is also correlated to the teeth, oral bacteria and time. Oral bacteria especially 'Streptococcus mutans' ferments sugars in the sweetened beverages into acid producing a sustained acidic environment of pH <5.5. This starts a demineralization process that is capable of destroying tooth enamel (Steyn et al, 2003). Since sugars from soft drinks have strong adhesive properties, its clearance from the mouth by saliva is slow and difficult. This can easily contribute to dental decay. Individuals who consumed three or more sugared sodas a day had a 17- 62% higher rate of dental cavities (Peterson, 2007). WHO has recommended a sugar intake of less than 10% of total energy intake for the prevention of caries. In South Africa, consumption in urban areas has exceeded the 10% recommended by the WHO. The prevalence of dental caries approaches 90% in most South African adult communities (Steyn et al, 2003; Mercola, 2009).

Dental erosion is the destruction of tooth substance by chemical processes caused by a variety of extrinsic and intrinsic factors. This disease differs from dental caries in that it is not caused by bacteria (Medilexicon Medical Dictionary, 2012). Extrinsic factors causing dental erosion can be frequent consumption of acidic foodstuffs like soft drinks. Dental erosion is the most common chronic dental disease of children aged 5–17 years. Acids in the soft drinks are able to dissolve enamel within 20 minutes of consumption (Mercola, 2009). In comparison to the volume of beverage consumed, the length of time the teeth are exposed to the acidic environment is more crucial to erosion. Carbonated drinks are more detrimental than non carbonated beverages since they are more acidic and may be often held in the mouth for a longer time. Factors that have a modifying effect on the development of erosion include the amount, type and strength of the acid level, buffering capacity of the drink and concentration of phosphate, calcium and fluoride in the drinks (Sales-Peres et al, 2007).

Stained teeth: This is discoloration of teeth either by extrinsic or intrinsic factors (Medilexicon Medical Dictionary, 2012). The colorants used in soft drinks often lead to brownish black/yellowish stains on teeth.

   b) Overweight and obesity

Overweight is a medical condition where the body mass index is between 25 and 29.9 and obesity is a condition where the body mass index is 30 or above (Goedecke, Jennings & Lambert, 2006). Overweight and obesity are the fifth leading risk for global deaths. According to the 2008 WHO report of South Africa, 65% of adults are overweight and 31% are obese.

Obesity is a multifactorial disease. Soft drinks do not cause obesity but is only a significant contributor. The main culprit is the sweeteners found in soft drinks. The sweeteners in soft drinks contain is highly caloric than ordinary sugar and induces physiologic and hormonal responses that lead to weight gain (Mercola, 2009). A meta-analysis of 88 studies showed that increased soft drink intake was associated with increased energy intake and body weight (Vartanian, Schwartz & Brownell, 2007). Consumption of sweetened soft drinks leads to decreased energy expenditure, decreased hunger satisfaction leading to increased food intake and thus contributing to obesity (St-Onge et al, 2003; Vartanian et al 2007). Various studies have shown that there is a drastic increase of both overweight and obesity in children over the years during which there has been an increased intake of processed foods and that too in large servings (Forshee et al, 2003; St-Onge et al, 2003).Overweight and obesity in children is particularly alarming because of the predisposition to morbidity and mortality. Some of the medial abnormalities associated with overweight and obesity during childhood are "elevated serum lipids, blood pressure, and serum insulin, type 2 diabetes, increased linear growth and advanced bone age, hepatic steatosis, cholelithiasis, and sleep apnea" (Mercola, 2009).

c) **Liver diseases**

Drinks with a high sugar content can cause a condition called *non-alcoholic fatty liver* disease where there is accumulation of fat inside liver cells (Medilexicon Medical Dictionary, 2012). People drinking more than two servings of soft drinks a day have increased chances for a fatty liver, leading to cirrhosis of the liver very similar to that found in chronic alcoholics (Mercola, 2009). Fructose, found in soft drinks is highly absorbable in the liver where it is converted to fat (steatosis). This may induce fatty liver. Even small doses of aspartame which is found in diet drinks and the preservative sodium benzoate can cause liver cell damage eventually lead to cirrhosis of the liver and various other conditions (Byme, 2011).

d) **Bone diseases**

Osteoporosis is a medical condition in which the bones become brittle and fragile from loss of tissue, as a result of hormonal changes, or deficiency of calcium or vitamin D (Medilexicon Medical Dictionary, 2012). During the formation of new bones and remodeling of old bones, the body maintains a steady phosphorus and calcium ratio in the bloodstream. Intake of phosphoric acid containing soft drinks (like colas) causes an elevated level of phosphorus in the blood (Mercola, 2009). Furthermore, the increased ingestion of sugar from the highly caloric soft drinks increases urinary excretion of calcium, magnesium, chromium, copper, zinc, and sodium by impairing reabsorption in the kidneys. This loss of calcium in the blood leads to activation of the parathyroid hormone (PTH), causing the release of calcium from the bones for maintaining the balance. This process when continued over time, results in the weakened bone structure (osteoporosis). This excess of calcium now in the blood is eliminated by excretion in the urine, deposition in joints (causing osteoarthritis, bursitis, gout,), formation into stones (like kidney stones), and deposition in arteries (calcified plaque). Therefore with less calcium available, the bones become more porous and prone to fracture (Mercola, 2009).

The tolerable upper limit of phosphorus in children is 3-4 grams. A 12-ounce can of carbonated soft drink contains phosphoric acids averaging about 30 milligrams. Even this low amount can be damaging if consumed in excess especially during the peak bone-building years of childhood and adolescence. Phosphoric acid in the drink can leach toxic amounts of aluminum (from the can) into the soft drink. Aluminum exposure increases the amount of bone break-down, while, at the same time, reducing new bone formation. Aluminum causes excessive loss of calcium in the urine resulting in osteoporosis accompanied by severe bone pain (Vartanian et al, 2007; McGartland et al, 2003).

e) **Chronic kidney disease**

Chronic kidney disease also known as chronic renal disease, is a progressive loss in renal function over a period of months or years (Medilexicon Medical Dictionary, 2012). Individuals who consume a lot of artificially sweetened drinks are more likely to experience a decline in kidney function; especially when there is a consumption of more than two beverages a day. Cola drinks can lead to increased demineralization of calcium from bones leading to formation of insoluble calcium stones in the kidney. The metabolism of high-fructose corn syrup used to sweeten soft drinks may lead to hyperuricemia leading to formation of uric acid crystals in the kidney. Drinking three cans of soft drink per week can increase the risk of developing kidney stones by 15 percent (Vartanian et al, 2007; Mercola, 2009).

f) Diabetes

Diabetes is a metabolic disease where there is an elevated blood sugar level. As of the year 2008, the prevalence of diabetes in the South Africa was about 10% among the adults (WHO, 2008). Caffeine in the soft drinks causes the release of adrenaline which is accompanied by a rise in blood sugar. The pancreas then reacts by secreting insulin which lowers blood sugar levels by pushing sugar into cells for oxidation and energy production. Excess sugar is then stored as fat. A can of soft drink contains about 10 teaspoons of sugar. Thus, excessive consumption exceeds the WHO recommended 10% limit of calorie intake from added sugars, causing a sustained increase in blood sugar level specifically type II diabetes. Sugar causes the clumping of red blood cells. This obstructs the flow of delivering oxygen to the cells and removing carbon dioxide from the cells. The result is a detrimental build-up of wastes (Vartanian et al, 2007; Mercola, 2009).

g) Adrenal fatigue

Adrenal fatigue is a syndrome that results when the adrenal glands function below the necessary level (Medilexicon Medical Dictionary, 2012). During soft drink intake, a 'stress' situation is induced and cell metabolism speeds up. The adrenal glands responds to the stress and maintains homeostasis. Continuos soft drink consumption causes overstimulation of the adrenals leading to adrenal exhaustion; symptoms of which are fatigue, lethargy, lack of energy ,sleep difficulties, lightheadedness, dizziness, lowered blood pressure and blood sugar, nausea, body pain, weight gain, and being prone to infections. Caffeine in the drinks stimulates the adrenal gland without providing actual nourishment (Vartanian et al, 2007; Mercola, 2009).

h) Heartburn & acid reflux

Acid reflux is the condition in which the acid in the stomach regurgitates towards the oesophagus. This causes indigestion which is *heartburn* (Medilexicon Medical Dictionary, 2012). Heavy consumption of soft drinks is a strong predictor of heartburn. Acidic carbonated beverages deliver a lot of air in the form of carbon dioxide to the stomach, which can cause distension thus, triggering reflux. As the consumption of carbonated soft drinks increases, there is an increased duration of oesophageal exposure to acid. The consumption of one can of soda a day can lead to 53.5 minutes of elevated acid levels in the stomach. As a result, severe irritations in form of chest pain or heartburns occur (Wilson, 2007; Mercola, 2009).

i) Hypertension

Hypertension is a chronic medical condition where there is an elevated blood pressure in the arteries (Medilexicon Medical Dictionary, 2012). The following mechanisms have been suggested to explain how soft drinks can cause high blood pressure i) Obesity which is an outcome of increased soft drink intake puts the heart under great strain to pump enough blood thus predisposing to hypertension. ii) The glucose and fructose from the beverages increase levels of uric acid in the blood interfering with blood vessels' ability to dilate and expand, thus causing a rise in pressure. iii) Excess sugar from the soft drinks causes the body to retain more water, and can also increase blood pressure. iv) The sugar in the drinks may also increase levels of catecholamine hormones, which can cause blood pressure to rise (Mercola,2009; Park,2011).   The American Heart Association recommends that soft drink consumption be restricted to no more than three 355 ml cans of soda a week (Vartanian et al, 2007; Brown et al, 2011). Prevalence of hypertension in South Africa is 42% (WHO, 2008).

j) Heart diseases

Research has shown that drinking more than one soft drink a day is associated with an increased risk of developing *metabolic syndrome*. This syndrome is a group of symptoms such as "central obesity, elevated blood pressure, elevated fasting blood sugar, elevated fasting triglycerides, and low levels of HDL or 'good' cholesterol" (Mercola, 2009; Medilexicon Medical Dictionary, 2012). Higher prevalence of the metabolic syndrome poses a greater risk for cardiovascular disease. Individuals with greater intake of soft drinks typically have unhealthy diets, and a sedentary life. Larger consumption of sweeteners found in soft drinks can lead to weight gain, increased insulin resistance, a lowering of high density lipids and an increase in triglyceride levels. The caramel content of soft drinks can also promote insulin resistance and can be "proinflammatory". Caffeine in the drinks blocks neurotransmitter receptor sites in the central nervous system causing constriction of the cerebral arteries, rapid heartbeat, high blood pressure, and excessive excretion of urine (Dhingra et al, 2007; Vartanian et al, 2007; Mercola, 2009).

k) Gastrointestinal distress

Gastrointestinal distress is a condition where there is increased stomach acid levels and moderate to severe gastric inflammation with possible stomach lining erosion (Medilexicon Medical Dictionary, 2012). Drinking soft drinks upsets the acid-alkaline balance of the stomach lining, creating a sustained acid environment causing inflammation of stomach and duodenal lining. Phosphoric acid in colas is neutralized in the body by its use of alkaline minerals like sodium, potassium, magnesium, and calcium forming salts which are then excreted in the urine. This sodium depletion creates acidity in the bowels. Mucous plaques then grow on the intestines, causing serious bowel diseases. Prolonged low stomach acidity causes overgrowth of harmful bacteria, yeasts and parasites in the gastrointestinal (GI) tract. This may break down the protective mucosal lining, thus allowing the penetration of microorganisms into the bloodstream, lodging in organs and cause the formation of carcinogens that provoke cancer. Digestion is impaired since phosphoric acid causes the body to reduce secretion of hydrochloric acid used for digestion of protein and fats and the absorption of minerals. This inadequate digestion results in bloating and flatulence (Vartanian et al, 2007; Mercola, 2009).

l) Caffeine addiction

Caffeine addiction is a compulsion to take caffeine. A typical can of cola contains 35 to 38 milligrams. Diet drinks can have even more caffeine –around 40 mg. Childhood use of caffeine can lead to dependence later in life with negative effects on brain development. Regular users when not consuming caffeinated drinks often are subject to mental sluggishness , depression, and a dull, generalized headache. At excessive doses, caffeine can cause aggression, restlessness, anxiety, recklessness, insomnia, irritability, and irregular heart beat (Mercola, 2009).

m) Infections

Sugar in the soft drinks impairs immune function by competing with Vitamin C for transport into white blood cells. This reduces the ability of white blood cells to destroy invading bacteria, which leads to chronic infections. Sugar also supports the growth of harmful bacteria and yeast in the GI tract which leads to infestations in the blood and body organs (Vartanian et al, 2007).

n) Neurological disorders

Disorder of the nervous system of the body is termed *neurological disorders*. Aspartame, used in diet sodas, is a potent neurotoxin and endocrine disrupter. On digestion, aspartame breaks down into three metabolites: aspartic acid, phenylalanine, and methanol. The product *aspartic acid* causes serious chronic neurological disorders by over stimulating neurons such that sensitive neurons are slowly destroyed *Phenylalanine* decreases serotonin (a brain neurotransmitter related to emotion and sleep) leading to emotional disorders, depression, and poor quality sleep. *Methanol* is metabolized by the liver into formaldehyde (which is a neurotoxin, carcinogen, mutagen, and teratogen) and formic acid. Methanol slowly accumulates and causes symptoms which include headaches, tinnitus, shooting pains, memory lapses, numbness, and nerve inflammation, blurred vision, retinal damage, and blindness (Vartanian et al, 2007; Mercola, 2009).

o) Cancer

Some of the artificial sweeteners used such as saccharin have been shown to have carcinogenic effect in humans. Among the different types of cancer found in humans, pancreatic cancer is the most likely to be attributed to soft drinks. People who drink two or more sweetened soft drinks a week may have a higher risk of pancreatic cancer. The high levels of sugar in soft drinks increase the level of insulin in the body which is produced in the pancreas. Rising insulin promotes pancreatic cancer cell growth. The caramel coloring in the soft drinks also is a cancer-causing agent. The metabolic product of aspartame, formaldehyde over time gets accumulated and is carcinogenic (Vartanian et al, 2007; Leap & William, 2009 ; Mercola, 2009).

Methodology

Research Design

The design used for the study was the cross-sectional survey which is a type of the descriptive design. Gay (1992) asserts that, the descriptive survey design allows a researcher to gather information on the present state of the topic being examined. The study adopted this design in order to have the opportunity to determine the trends in consumption of soft drinks among students at the Sunyani Technical University. But the design has its own pitfalls as it does not give room for the manipulation of variables as in experimental research (Yin, 2001).

Population

Population is an entire aggregation of cases that meet designated set of criteria (Polit & Hungler, 1996). It must be noted that whatever the basic unit, the population always comprises the entire aggregation of elements in which the researcher is interested. The population for the study consists of all the students in the Department of Hospitality and Tourism totaling 269.

Sample and Sampling Procedure

A sample is basically the subset of the real quantum of individuals of a population. In order to give the sample size a sound scientific methodological backing, the table for selecting sample size given by Krejcie and Morgan (as cited in Sarantakos, 1997, p. 163) was employed.

Students were selected using the simple random sampling procedure. In this kind of sampling procedure, the probability that any of the members can be selected is high (Sarantakos, 1997, p. 141). A list of a total number of students in the Department of Hospitality and Tourism formed the sampling frame. The lottery method was used in the selection procedure. Paper chits, which were written YES or NO to represent the total number of students in the department were folded and then tossed into a bowl, out of which each folded chit w picked by each student. The students who picked YES were included in the study.

Research Instrument

The questionnaire was the sole data collection instrument. Reasons for the choice of the instrument were that the students from which data was sought from were literates who can read and write. This made the questionnaire an appropriate instrument to use for data collection. Also, the questionnaire provided a high level of anonymity to respondents who wanted to remain unknown. Again, the questionnaire is appropriate when collecting information from a large number of people, within a shorter possible time when especially the population is easily accessible (Deng, 2010; Amedahe & Gyimah, 2005).

The questionnaire items were put into three parts (sections A, B, and C). Section A sought for the background information of the respondents, and the remaining sections (B & C) covered the first and second research questions respectively. The five-point Likert scale was used in structuring the questionnaire items.

Data Analysis

This study sought to determine the trends in consumption of soft drinks among students at the Sunyani Technical University. The study adopted the descriptive statistics such as the use of frequencies, percentages, mean of means and standard deviation distributions in analyzing the information gathered using the Statistical Product and Service Solutions.

Results and Discussion

Data was analyzed and presented systematically beginning with the background information of the respondents, followed with the research questions that guided the study. Table 1 shows the characteristics of students in the Department of Hospitality and Tourism who served as respondents for the study.

Table 1: **Characteristics of Sampled Students (n=159)**

Variable	Subscale	No.	%
Gender	Male	16	10.1
	Female	143	89.9
Age	20 years and below	40	25.2
	21-30 years	111	69.8
	31-40 years	7	4.4
	41-50 years	1	0.6
Level	100	105	66.0
	200	13	8.2
	300	41	25.8

Source: Field data, 2018

The targeted sample size of the study was 269 students; out of this, 159 students were involved in the study. This indicates 100.0% return rate. Table 1, reveals that 16 of the students were males representing 10.1% whereas 143, representing 89.9% were females. This indicates that the majority of the students were females.

Again, with respect to the age of the respondents, 25.2% of the respondents were 20 years and below, 69.8% were between 21-30 years, 4.4% were between 31-40 years, and 0.6% were between 41-50 years. Thus the majority of the students were between 21-30 years and below 20 years. It is also evident from Table 1 that the majority of the respondents were Level 100 and 300 students. This is because, 105 students representing 105% were Level 100 students, 13 students, representing 8.2% were Level 200 students, and 41 students representing 25.8% were Level 300 students.

This section presents the results and discussions of data collected to answer the two research questions formulated to guide the study. It comprised data from the questionnaire.

Type of drink (non-alcoholic) mostly consumed among students

Research Question 1: What type of drink is the most consumed among students? The main objective of this research question was to find out the type of drink (non-alcoholic) students consume most. The responses are illustrated in Table 2.

Table 2: Views of students concerning the type of drink they consume most (n=159)

Statement	M	SD
I take in non-alcoholic drink.	1.23	.42
Carbonated Drink (i.e. Coca Cola, Sprite, Pepsi, etc.).	3.16	1.02
Juices (i.e. Freshly squeezed to concentrated orange juice, pineapple juice, etc.).	3.60	1.01
Mocktails (e.g. A mixture of two or more juices and other soft drinks).	2.69	1.21
Energy Drink (e.g. Red Bull, Blue Jeans, Rox, Lucozade, Gluconade etc.).	2.38	1.19
Sweetened Fruit Juices	3.18	1.25
Tea	3.78	1.33
Coffee	2.43	1.24
Milkshake (i.e. a cold drink made of milk).	2.74	1.23
Smoothies (i.e. a blend of fruits, vegetables, milk, yogurt, ice-cream and other foods).	3.05	1.33

Source: Field data, 2018
Scale: 1 = Never, 2 = Rarely
3 = Sometimes 4 = Often
5 = Always
Mean of means = 2.82
Mean of Standard Deviation = 1.12

A look at Table 2 shows that the students to a large extent consumed non-alcoholic drinks. A mean of 1.23 implies that a lot of the students agreed that they take in non-alcoholic drinks. A mean of means of 2.82 and a Mean of Standard Deviation of 1.12 clearly indicates that majority of the students agreed that they consume most of the soft drinks sometimes. This is shown in the following instances in the rest of the items.

When students were asked whether they take in non-alcoholic drinks, it was found out that a significant majority of the students responded "yes". A mean of 1.23 and a standard deviation of .42 was attained. This findings support the report that on an estimate, 82.5 liters of soft drinks are consumed per person per year. According to the '2008 Global Soft Drinks' report, America alone represents 25.0% of the total beverage market energy intake consumption of more than 50 billion liters of soft drinks per year (Zenith International, 2008). Also, the majority of the students responded that they consume carbonated drinks such as pepsi, coca-cola, sprite etc sometimes. A mean of 3.16 and a standard deviation of 1.02 was attained for this item and this falls within the option "sometimes" looking at the scale under Table 2. In connection with the statement; "How frequent students consume juices", the majority of the students responded that they consume juices often. The item recorded a mean of 3.60 and a standard deviation of 1.01 which fall under the scale of 4 (often) when approximated to the nearest mean.

In line with the statement; "How frequent students take in Mocktails", a mean of 2.69 and a standard deviation of 1.21 was recorded meaning to a large extent, the students responded that they take in mocktails sometimes. Converting the mean to the nearest whole number, it could be seen that the mean falls at 3 which depicts that they sometimes take in Mocktails (eg. A mixture of two or more juices and other soft drinks).

13

With respect to how frequent the students take in energy drinks, a mean of 2.38 and a standard deviation of 1.19 were obtained clearly showing that the respondents rarely take in energy drinks such as blue jeans, red bull, lucozade, gluconade etc. Concerning how frequent students take in sweetened fruit juices, a mean of 3.18 and a standard deviation of 1.25 was realized. Meaning that a greater proportion of students responded that they take in sweetened fruit juices sometimes. Again, it can be read from the table that students responded that they often take in tea. This realized from the mean of 3.78 and a standard deviation of 1.33. Students' responses on how frequent they take in coffee revealed that they rarely take in coffee. The statement recorded a mean of 2.43 and a standard deviation of 1.24 which reflect option 2 looking at the scale under Table 2. Moreover, with regards to the statement, "How often students take in Milkshake" majority of the students responded that they sometimes take in milkshake. This is evident with the mean of 2.74 and a standard deviation of 1.23. When the mean is approximated to the nearest whole number, is reflects option 3 relating it to the scale under Table 2. Finally, Table 2 indicates that majority of the students sometimes take in smoothies such as ice-cream, milk, yogurt, vegetables etc. This is evident with the mean of 3.05 and standard deviation of 1.35, which when approximated to the nearest whole number, falls within option 3 (sometimes) on the scale under Table 2. These finding are in line with a study which was carried out among 400 adolescents aged 8-17 years in Dar-EsSalaam, Tanzania. The frequency and amount of soft drink consumption was assessed. The prevalence of consumption of soft drinks was 61.5%; out of which the prevalence of sweetened juice consumption was 68.3% and prevalence of carbonated beverages was 61.3%. Compared to carbonated beverages which was consumed only once a week, fruit juices was consumed daily by most students (Dhirani, 2010).

From the above, it can be concluded that the students agree that they often take in non-alcoholic drinks such as Juices (i.e. freshly squeezed to concentrated orange juice, pineapple juice, etc) and tea. This is evident with the means of 3.60 and 3.78 respectively. Also majority of the students sometimes consume non-alcoholic drinks such as carbonated drinks (i.e. coca cola, Pepsi, and Sprite etc), mocktails (i.e. mixture of soft drinks), sweetened soft drinks, milkshake and smoothies. Majority of the students also rarely take in energy drinks and coffee. However, none of the students responded that he or she always and never take in any of the non-alcoholic drinks stated above.

Level of awareness of health hazards associated with drinks (non-alcoholic)

Research question 2: What is the level of awareness of health hazards associated with drinks? This research question attempts to find out the students level of awareness of health hazards associated with non-alcoholic drinks. The responses are illustrated in Table 3.

Table 3: Views of students concerning their awareness of health hazards associated with non-alcoholic drinks (n=159)

Statement	M	SD
Awareness of health hazards associated with non-alcoholic drinks	1.65	.76
Overweight and obesity	2.94	1.38
Skin cancer	2.39	1.05
Pain in joints	2.44	1.06
Weak eye vision	2.58	1.08
Dental (tooth) decay	3.40	1.36
Weak bones	2.87	1.20
Diabetes (increased sugar level in blood)	3.60	1.31
High blood pressure	2.97	1.26
Kidney stones	2.69	1.10
Darkening of skin	2.44	1.17
Addiction	2.90	1.37
Fracture of bones	2.37	1.20

Source: Field data, 2018
Scale: 1   =   Strongly Disagree,   2   = Disagree,   3   = Uncertain,
        4   =   Agree,   5   = Strongly Agree
Mean of means = 2.71
Mean of Standard Deviation = 1.18

Generally, a careful look at Table 3 shows that the students to a large extent were not aware of most of the health hazards caused by taking in soft or non-alcoholic drinks. In line with this, a mean of means of 2.71 and a mean of standard deviation of 1.18 was achieved for the items designed which clearly indicates that the students were aware of the dangers non-alcoholic drinks pose to them. The following instances of the individual items attest to that fact.

From Table 3, a mean of 1.65 and .76 standard deviation was attained meaning that majority of the respondents did not know about the side effects of taking in non-alcoholic drinks. It is clearly noticeable from Table 3 that majority of the students were uncertain of the fact that non-alcoholic drinks could cause obesity and overweight, weak eye vision, dental (tooth) decay, weak bones, high blood pressure, kidney stones, and addiction. With this items, the means of 2.94, 2.58, 3.40, 2.87, 2.97, 2.69, 2.90 and standard deviations of 1.38, 1.08, 1.36, 1.20, 1.26, 1.10, and 1.37 were attained respectively. These indicate that the means fall on the scale 3 (uncertain) looking at the scales under Table 3. Though students were uncertain about this cause, Mercola (2009) reports that obesity is a multifactorial disease. Soft drinks do not cause obesity but is only a significant contributor. The main culprit is the sweeteners found in soft drinks. The sweeteners in soft drinks contain is highly caloric than ordinary sugar and induces physiologic and hormonal responses that lead to weight gain. With regards to the findings on dental decay, Peterson (2007), also makes it clear that since sugars from soft drinks have strong adhesive properties, its clearance from the mouth by saliva is slow and difficult. This can easily contribute to dental decay.

Individuals who consumed three or more sugared sodas a day had a 17- 62% higher rate of dental cavities. It is obvious from Table 3 that the students at the Department of Hospital and Tourism immediately disagreed to the statement that intake of non-alcoholic drinks can cause skin cancer, pain in joints, darkening of skin and fracture of bones. Concerning this, means of 2.39, 2.44, 2.44, 2.37 and standard deviations of 1.05, 1.06, 1.17, and 1.20 were achieved for this statement respectively. The means which falls on scale 2 affirms the position that majority of the students disagreed to these views. However, Vartanian et al, 2007; Leap and William, 2009; and Mercola, 2009, emphasize that some of the artificial sweeteners used such as saccharin have been shown to have carcinogenic effect in humans. Among the different types of cancer found in humans, pancreatic cancer is the most likely to be attributed to soft drinks. People who drink two or more sweetened soft drinks a week may have a higher risk of pancreatic cancer. The high levels of sugar in soft drinks increase the level of insulin in the body which is produced in the pancreas. Rising insulin promotes pancreatic cancer cell growth. Also, Mercola (2009), postulates that during the formation of new bones and remodeling of old bones, the body maintains a steady phosphorus and calcium ratio in the bloodstream. Intake of phosphoric acid containing soft drinks (like colas) causes an elevated level of phosphorus in the blood. Concerning, the statement about diabetes, the majority of the students agreed to it. A mean of 3.60 and a standard deviation of 1.31 was obtained for this item. The mean when converted to the nearest whole number falls on scale 4 which represents the option agree. This finding is in agreement with that of Vartanian et al, 2007; and Mercola, 2009, that a can of soft drink contains about 10 teaspoons of sugar. Thus, excessive consumption exceeds the WHO recommended 10% limit of calorie intake from added sugars, causing a sustained increase in blood sugar level specifically type II diabetes. It can therefore be concluded that students were aware of the fact that soft drinks can cause diabetes.

From the above mentioned points, it will suffice to concede that, the students were unaware of most of the dangers that soft or non-alcoholic drinks could pose on their health. This is because; among all the statements of health hazards associated with intake of soft or non-alcoholic drinks, the students agreed to be aware of only diabetes. They however disagreed to skin cancer, pain in joints, darkening of skin, and fracture of bones. Also, they were uncertain as to whether overweight and obesity, weak eye vision, dental decay, weak bones, high blood pressure, kidney stones and addiction could be caused by intake of soft drinks.

Findings

The following were the findings of the study:

1. It was found out that, students mostly consumed non-alcoholic drinks such as juices (i.e. freshly squeezed to concentrated orange juice, pineapple juice, etc) and tea. Sometimes, they consume carbonated drinks (i.e. coca cola, Pepsi, and Sprite etc), cocktails (i.e. mixture of soft drinks), sweetened soft drinks, milkshake and smoothies. However, students rarely consumed energy drinks and coffee.

2. Concerning the level of awareness of health hazards associated with drinks, it was found out that, the students were unaware of most of the dangers that soft or non-alcoholic drinks could pose to their health. This was because; students were only aware of diabetes as the health hazard associated with taking in soft drink, but were unaware of other health complications such as: skin cancer, pain in joints, darkening of skin, and fracture of bones, overweight and obesity, weak eye vision, dental decay, weak bones, and high blood pressure.

Conclusions

These conclusions were drawn as a result of the findings realized for the study. In terms of the types of non-alcoholic drinks students consume, the students' responses showed a high consumption of them. With this, students confirmed that they take in juices and tea often. Carbonated drinks, mocktails, sweetened juice, milkshake and smoothies were taken sometimes. Energy drinks and coffee were rarely taken. However, none of the students always and never take in any of the non-alcoholic drinks stated above. In relation to students awareness of the health hazards associated with the intake of soft or non-alcoholic drinks, the students were unaware of most of the dangers that soft or non-alcoholic drinks could pose on their health.

Policy Recommendations for Management

The following recommendations were made for policy makers:

1. Manufacturers of soft drinks should be checked thoroughly to reduce the amount of chemicals and sugar they use in producing soft or non-alcoholic drinks.
2. Stakeholders such as the Ministry of Health and the Food and Drugs Authority should make special efforts to enhance awareness of the health hazards associated with the intake of soft or non-alcoholic drinks through the media and public education to the students and especially among the low educated.

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